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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,982	05/25/2006	Shuichi Fujii	81872.0113	6452

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EXAMINER

BERDICHEVSKY, MIRIAM

ART UNIT	PAPER NUMBER
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1795

NOTIFICATION DATE	DELIVERY MODE
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05/07/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/580,982	Applicant(s) FUJII ET AL.	
	Examiner MIRIAM BERDICHEVSKY	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on election 4/8/2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 10-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>4/2/2009, 4/18/2008, 5/25/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-9 in the reply filed on 4/8/2010 is acknowledged.
2. Claims 10-26 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected solar cells, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 4/8/2010.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1-9 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. Claims 1-9 recited "a bus bar" in reference to two different objects and then further refer back to "the bus bar" (claim 1, line 8; claim 2, line 1; claim 3, line 2; claim 8, line 2 and claim 9, line 2) without clarifying which bus bar. Denotations such as "a first bus bar" and "a second bus bar" would clarify the claim language. The claims will be broadly interpreted as referring to either one or both.
6. Claim 3 recites the limitation "the width" in line 2. There is insufficient antecedent basis for this limitation in the claim. The width is not previously described or defined not is every other dimension of the object defined thereby

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implicitly describing the width. From herein "the width" is broadly interpreted as any dimension of the object.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komori (US 6265242) and Lindmayer (US 4057439).

As to claim 1, Komori teaches a first solar cell with a bus bar on the light receiving side connected serially to the bus bar of a second solar cell located on the non-light receiving side (figure 7B). The bus bars of Komori have an edge along the longitudinal direction of the bus bar electrode and a portion from the edge to a predetermined distance inward therefrom (figures 5A-B and 7A-B).

Komori is silent to the solar cell elements being sealed into a filler and therefore is silent to an edge along the longitudinal direction of the bus bar

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electrode and a portion from the edge to a predetermined distance inward therefrom in direct contact with the filler. Lindmayer teaches encapsulating serially connected solar cells for their protection from ambient conditions (claim 1 and figure 2). One of ordinary skill would have found it obvious to encapsulate the cells of Komori with filler in order to protect the cells from ambient conditions as taught by Lindmayer. The Examiner notes that modified Komori reads on the instant claimed invention because modified Komori will have every edge and distance inward therefrom which is not covered by solder (seen in figure 7B of Komori) in direct contact with the filler.

Regarding claim 2, modified Komori teaches that the bus bar (503) is joined to the inner lead (504) with solder (505) at its center in the transverse direction (Komori: figures 7A and 7B).

Regarding claim 3, modified Komori depicts the width of the inner lead (504) being smaller than the width of the bus bar (503) (Komori: figures 7A and 7B).

Regarding claim 4, modified Komori teaches a plurality of finger electrodes (205) connected to the bus bar on the light receiving surface (Komori: figures 5A-B).

Regarding claim 5, modified Komori depicts the solder as being contained to the bus bar such that when in contact with filler the entire length of the finger electrodes will be in direct contact with the filler (Komori: figure 7A). Moreover, it would have been obvious to cover the entire length of the finger electrodes to protect the device from weathering as discussed above.

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10. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komori and Lindmayer as applied to claim 4 above and further in view of Okada (JP 2000332272).

Regarding claims 6-7, modified Komori is not explicit to the solder being constrained to the bus bar such that the bus bar such that when in contact with filler the entire length of the finger electrodes will be in direct contact with the filler (claim 5); the finger electrode has a coating (claim 6) made of solder resist (claim 7). Okada teaches a method of making a solar cell that uses a solder resist on a portion of the electrode to minimize forming solder bridges (abstract). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the solder resist on the finger electrodes at the juncture with the bus bar to prevent solder bridges between finger electrodes, as taught by Okada ([0005]).

11. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komori and Lindmayer as applied to claim 1 above and further in view of Tanaka (US 20020148499).

Regarding claim 8, modified Komori is silent to the solder specifically containing bismuth. Tanaka teaches a solar cell string which uses a lead free bismuth containing solder ([0019]) because lead is harmful ([0013]). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the solder of Tanaka in modified Komori because the solder is a known material used for the same intended purpose and is advantageously lead free making it safe for the environment, as taught by Tanake ([0013]).

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12. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komori and Lindmayer as applied to claim 1 above and further in view of Lally (US 6198207) and Kujas (US 4685604).

Regarding claim 9, modified Komori is silent to the composition of the solder and therefore the solder containing Sn and having a sum of contraction (shrinkage) coefficients by weight percent less than 2.8%. Lally teaches a solder composition for an electronic device which has Sn and a shrinkage coefficient of 0.3% which reduces the residual stresses after solidification of the solder (col. 5, lines 44-60). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the low shrink solder of Lally in modified Komori because the low shrinkage property reduces residual stresses, as taught by Lally (col. 5, lines 55-60) especially in light of the fact that the prior art has recognized the same problem: severe expansion and contraction of solder joints to promote stress and failure, as taught by Kujas (col. 1, lines 10-20).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **MIRIAM BERDICHEVSKY** whose telephone number is (571)270-5256. The examiner can normally be reached on M-Th, 10am-8pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. B./
Examiner, Art Unit 1795

/Alexa D. Neckel/

Supervisory Patent Examiner, Art Unit 1795